



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,325	02/07/2006	Eiji Akiyama	NECNE70207	1134
27667 7590 07/09/2008 HAYES SOLOWAY P.C. 3450 E. SUNRISE DRIVE, SUITE 140 TUCSON, AZ 85718				
EXAMINER				
BEST, ZACHARY P				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
07/09/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary**Application No.**

10/567,325

Applicant(s)

AKIYAMA ET AL.

Examiner

Zachary Best

Art Unit

1795

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 2/7/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-893)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date 02072006

FUEL CELL SYSTEM

Examiner: Z. Best S.N. 10/567,325 Art Unit: 1795 July 3, 2008

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. (US 2003/0157395 A1) in view of Roberts (US 3,556,161).

Regarding Claim 1, Ren et al. teach a fuel cell system comprising a fuel cell (2) provided with a fuel electrode (8), an oxidant electrode (10), and an electrolyte membrane sandwiched between them (6), and a fuel supply system supplying fuel to said fuel electrode (4) comprising a gas discharge unit (30) provided with a filter at a part of a member which excludes a reaction part of said fuel electrode and is in contact with the fuel (par. 42), wherein said filter is a membrane provided on a substrate (gas diffusion layer) (par. 42). However, Ren et al. does not specifically teach the membrane is a carbon dioxide permselective membrane.

Roberts teaches a membrane consisting of a porous layer of PTFE (substrate) and a nonporous layer of PTFE (col. 16, lines 48-68), which may be used as filtering media in fuel cells (col. 7, lines 64-75). The nonporous layer of PTFE would inherently be permselective to carbon dioxide as evidenced by Dounoucos (US 3,674,022). It would be advantageous to use the membrane of Roberts because the structure has increased tensile strength (col. 7, lines 32-50). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Ren et al. wherein the filter is constituted of a porous layer of PTFE and a nonporous layer of PTFE provided on said porous layer because Roberts teaches improved tensile strength of the membrane from the two different layers. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. *In re Robertson*, 49 USPQ2d 1949 (1999).

Regarding Claim 2, Ren et al. teach the fuel to be supplied is liquid fuel (par. 35) and said substrate is a vapor-liquid separation membrane (par. 42).

Regarding Claim 3, Ren et al. teach that pressure is required to push the carbon dioxide gas through the membrane (par. 43). A thicker membrane would inherently require more pressure to push the carbon dioxide across the interface. Therefore, it would have been obvious to one having ordinary skill in the art to adjust the pressure required to push the gas across the membrane by changing the thickness of the membrane because Ren et al. teach a pressure differential is required to make the gas separation succeed.

Regarding Claim 4, Roberts teaches the substrate is a porous membrane (col. 16, lines 48-68).

Regarding Claim 5, Ren et al. teach that the gas discharge unit is provided with a chamber communicated with said fuel supply system through said filter (30), and a catalyst is disposed in said chamber (par. 51).

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ren et al. in view of Roberts as applied to Claims 1-5 above, and further in view of Okuyama et al. (JP 2003-223920 A).

Ren et al. in view of Roberts teach the fuel cell system as recited in Paragraph 3. However, Ren et al. in view of Roberts fail to teach a first chamber with said filter and a second chamber with a catalyst.

Okuyama et al. teach a fuel cell system comprising a first chamber with a gas separation means communicated with the fuel supply system (3, drawing 2) and a second chamber (52) that is communicated with said first chamber (drawing 2) and provided with a catalyst in the chamber (par. 16). It is advantageous to use the two chambers as taught by Okuyama et al. because it keeps byproducts of the fuel cell reaction from being discharged outside the fuel cell system (pars. 6-7). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to create the fuel cell system of Ren et al. in view of Roberts with a gas charge unit provided with a first chamber that has an air port provided with a filter and is communicated with said fuel supply system through said

filter, and a second chamber communicated with said first chamber and provided with a catalyst in the chamber because Okuyama et al. teach the system keeps byproducts of the fuel cell reaction from being discharged outside the fuel cell system.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zachary Best whose telephone number is (571) 270-3963. The examiner can normally be reached on Monday to Thursday, 7:30 - 5:00 (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Art Unit: 1795

zpb

/Dah-Wei D. Yuan/

Supervisory Patent Examiner, Art Unit 1795